Technology
Arts Sciences
TH Köln

Course Manual ASR

Control Systems of Electrical Drives

− General information

Long name	Control Systems of Electrical Drives
Approving CModule	ASR_BaET
Responsible	Prof. Dr. Andreas Lohner Professor Fakultät IME
Valid from	summer semester 2023
Level	Bachelor
Semester in the year	summer semester
Duration	Semester
Hours in self-study	78
ECTS	5
Professors	Prof. Dr. Andreas Lohner Professor Fakultät IME
Requirements	Contents of the modules Fundamentals of Electrical Engineering, Power Electronics, Fundamentals of Electric Drives, Analogue Signals and Systems
Language	German
Separate final exam	Yes

Literature

Leonhard, W.: Regelung Elektrischer Antriebe, Springer Verlag

Wellenreuter, G.: Automatisieren mit SPS, Vieweg Verlag

Hameyer, K.: Elektrische Maschinen I und II, RWTH Aachen

De Doncker, R. W.: Elektrische Antriebe, RWTH Aachen

Final exam

Details	By means of an oral exam, the learned contents and competencies are queried
Minimum standard	Purely content knowledge defines the limit of pass
Exam Type	EN mündliche Prüfung, strukturierte Befragung

− Lecture / Exercises

Learning goals

Goal type	Description
Knowledge	As a basic knowledge of electrical drive technology, fundamentals in the modeling and simulation of oscillatory drives are first imparted. Then the variable speed drive inverter is discussed using the example of the externally excited DC machine with Vierquadrantsteller, so that it can be experienced how modern drives are constructed and how they are controlled or regulated. In this case, the speed and position control will be dealt with in a machine-unspecific manner. Then the field-oriented control of the asynchronous machine is presented. Finally, the switched reluctance machine is presented as an example of a modern drive and illustrated in practical experiments. The lecture is supported by the exercise, in which the drive structures and controls are modeled and simulated using Matlab / Simulink.
Skills	The students are able to carry out simple control engineering simulations and to use this knowledge to implement the drive.

Special requirements

Accompanying material	Lecture slides as pdf document Exercises Literature on the topic
Separate exam	No

Expenditure classroom teaching

Type	Attendance (h/Wk.)
Lecture	2
Exercises (whole course)	0
Exercises (shared course)	1
Tutorial (voluntary)	0

− Practical training

Learning goals

Goal type	Description
Knowledge	Application of analytical knowledge to the switched reluctance machine. Application of machine-specific control as well as program implementation of the same by means of the language C

Special requirements

Accompanying material	guide for practical training
Separate exam	No

Expenditure classroom teaching

Type	Attendance (h/Wk.)
Practical training	1
Tutorial (voluntary)	0